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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/054,213	11/13/2001	Ulrich Stimming	3245-695PCIP	7315

7590

04/23/2004

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EXAMINER

CREPEAU, JONATHAN

ART UNIT	PAPER NUMBER
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1746

DATE MAILED: 04/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/054,213

Applicant(s)

STIMMING ET AL.

Examiner

Jonathan S. Crepeau

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2001.
2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-9 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/381,113.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____

DETAILED ACTION

Claim Objections

1. Claim 1 is objected to because of the following informalities: in line 4, "have" should be "has." Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1 and 2 recite the limitation "whereby the fuel cell has a voltage that does not change sign and at most becomes zero so that $U(\text{fuel cell}) = U(\text{cathode}) - U(\text{anode}) > 0$." However, the use of the expression " > 0 " is not believed to be consistent with the language "at most becomes zero." If the voltage can be equal to zero, as set forth in the latter clause, then the expression " > 0 " should be changed to " ≥ 0 ". Correction or clarification is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-3 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Fedkiw et al (*J. Electrochem. Soc.*, 1988). Regarding claims 1 and 2, on page 2459, Fedkiw et al. teach a fuel cell comprising an anode-electrolyte-cathode unit having an anode catalyst. Regarding claims 1, 2, and 8, the fuel cell is a direct-methanol fuel cell that has a standard voltage of 1.21 V (see left column, first paragraph; Fig. 9). Regarding claims 1-3, a means (step) for impressing a positive voltage pulse on the anode is taught as applying repeated voltage pulses having an upper magnitude of 1.18 V (see page 2460, left column, first paragraph). Therefore, the fuel cell voltage does not change sign because the lowest voltage becomes 0.03 V. Additionally, pulses of a lower magnitude (0.4 V or 0.6 V) are also applied to the cell. In this case, the fuel cell voltage becomes either 0.81 or 0.61 V. In either case (the higher voltage or one of the lower voltages), the total voltage of the fuel cell still stays above zero, thereby satisfying the instantly claimed relationship.

Thus, the instant claims are anticipated.

Claim Rejections - 35 USC § 103

6. Claims 4-7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fedkiw et al. in view of Applicants' admission of prior art.

Fedkiw et al. is applied to claims 1-3 and 8 above. However, the reference does not expressly teach that internally reformed alcohols or hydrocarbons are used as the anode fuel, as

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recited in claims 4-7. Fedkiw et al. further do not explicitly teach that direct conversion of hydrocarbons takes place at the anode (claim 9).

On page 2 of the "Background of the Invention" section in the instant specification, Applicants admit that internally or externally reformed alcohols and hydrocarbons used as anode fuels are known.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because as exemplified by the admission in Applicants' specification, internally or externally reformed alcohols and hydrocarbons are known for use in fuel cell systems and are suitable in this capacity. The artisan, being aware of these fuels and the means for reforming them, would therefore be motivated to modify the anode fuel and/or fuel cell of Fedkiw et al.

Regarding the limitation that direct conversion of hydrocarbons takes place at the anode, the artisan would possess sufficient skill to ascertain that any unreacted hydrocarbons in a reformat stream would likely be converted directly on the anode. Accordingly, this limitation is not seen to distinguish over the Fedkiw et al. reference.

Response to Arguments

7. Applicant's arguments filed November 13, 2001 have been fully considered but they are not persuasive. Applicants urge that in Fedkiw, there is "a polarity change with electrolytic conditions." However, the Examiner does not find sufficient disclosure or evidence in Fedkiw

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that such a polarity reversal actually occurs. As set forth above, the higher magnitude voltage pulse (1.18 V) still has a lower magnitude than the open-circuit voltage of the fuel cell (1.21 V). Thus, it is believed that the voltage of the fuel cell would not fall below zero when the pulse is applied. Furthermore, the lower magnitude voltages may also be considered "pulses" within the meaning of the instant claims, and in this case, the voltage of the fuel cell would be well above zero (i.e., 0.81 or 0.61 V). Thus, given either interpretation of the Fedkiw reference, it is still submitted that the instant claims are anticipated by the reference.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski, can be reached at (571) 272-1302. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (703) 872-9306.

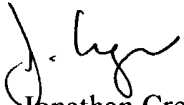
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jonathan Crepeau
Patent Examiner
Art Unit 1746
April 20, 2004